2023

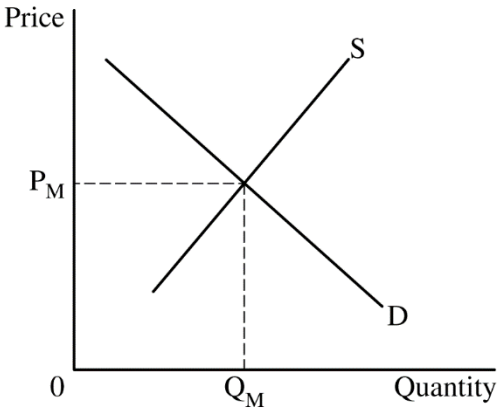
AP® Microeconomics

Scoring Guidelines
Set 2

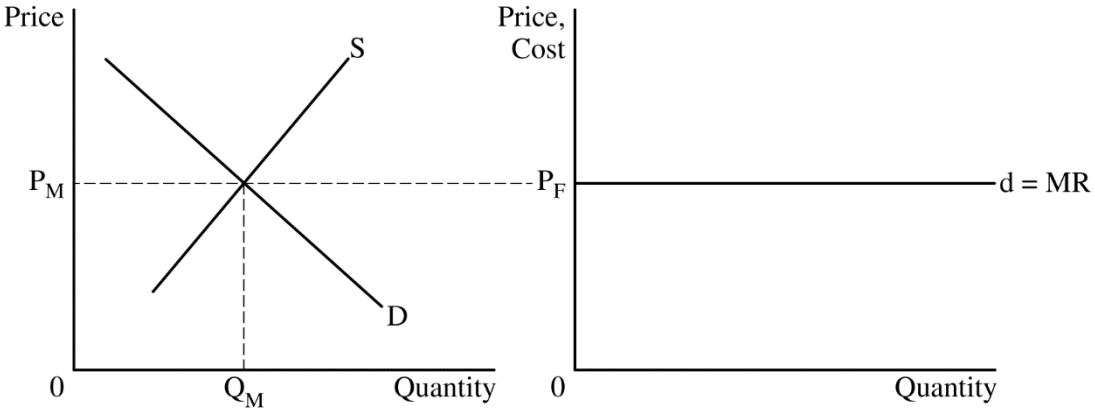
Question 1: Long — 10 points

(a) State that Anderson Company's accounting profit must be greater than its economic profit. **1 point**

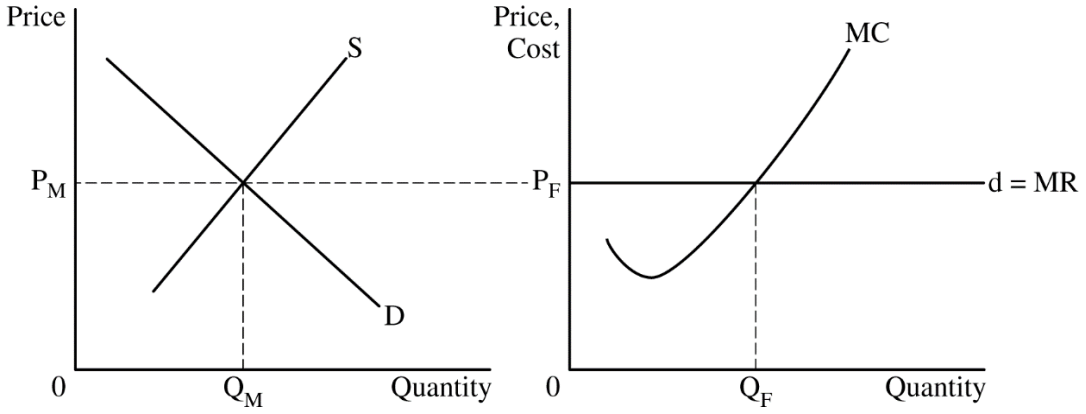
(b) Draw a correctly labeled graph of the market for Good G with a downward-sloping demand (D) curve and upward-sloping supply (S) curve and label the market equilibrium price as P_M and the market equilibrium quantity as Q_M. **1 point**



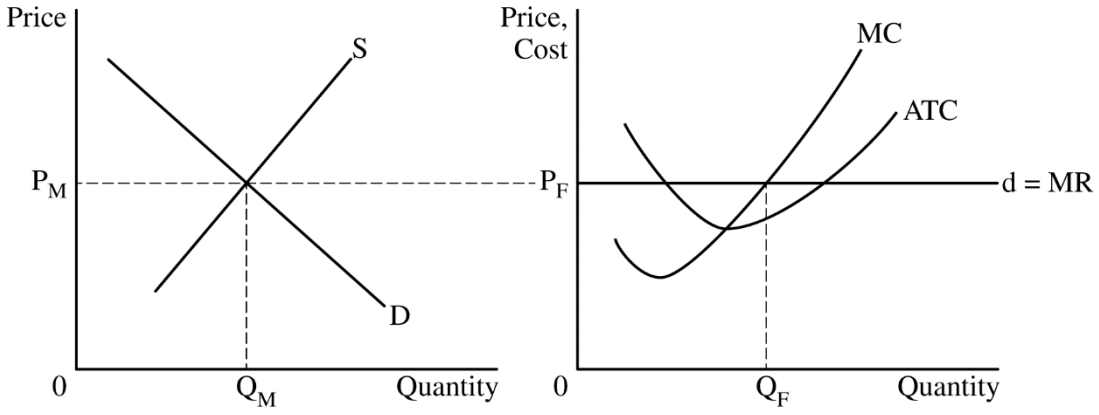
For the second point, draw a correctly labeled graph for the firm and show the firm's horizontal demand and marginal revenue (d=MR) curve extended from the market equilibrium price (P_M), and label the firm's price as P_F. **1 point**



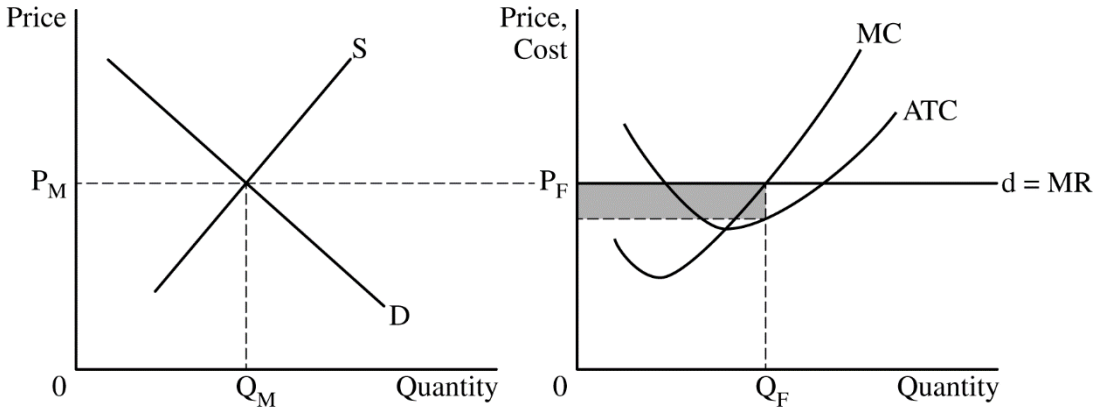
For the third point, the firm's graph must show a rising marginal cost (MC) curve and the profit-maximizing quantity, labeled Q_F where MR = MC. **1 point**



For the fourth point, the firm's graph must show the average total cost (ATC) curve below the firm's demand curve at Q_F and show the MC curve passing through the minimum point of the ATC curve. **1 point**

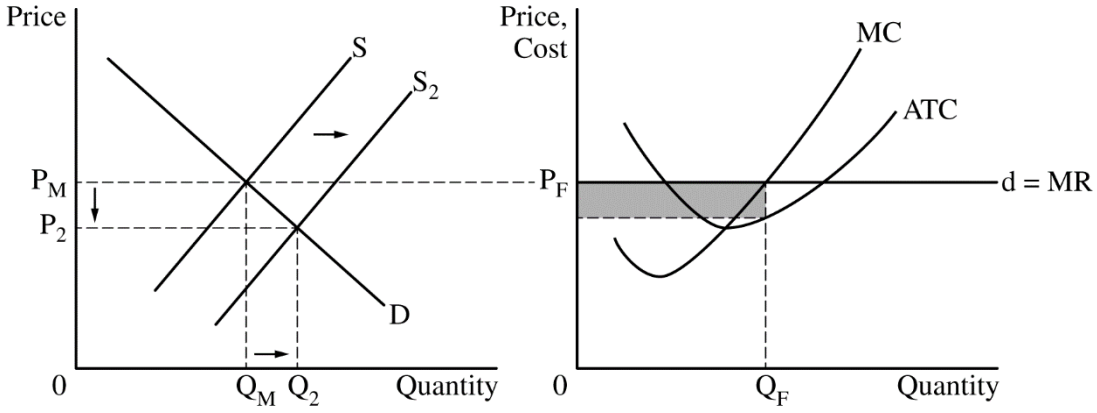


For the fifth point, the firm's graph must show the area representing positive economic profit, shaded completely. **1 point**

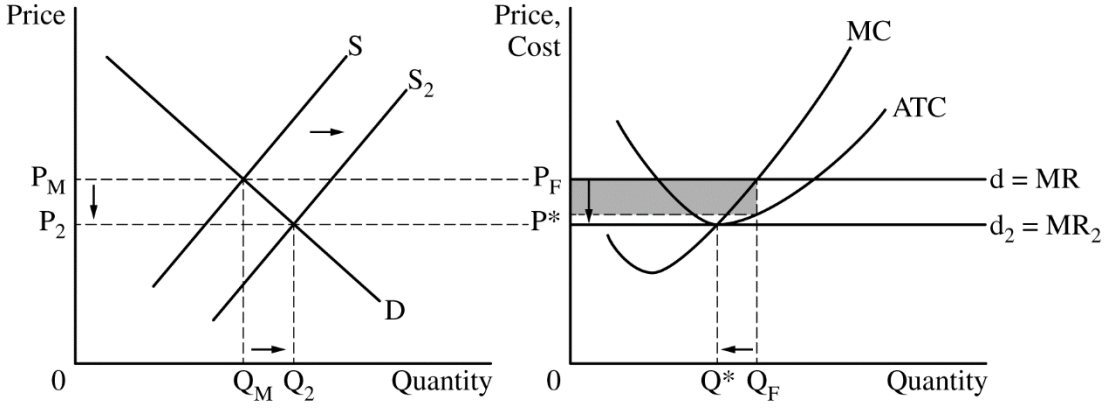


Total for part (b) 5 points

(c)(i) On the market graph from part (a), show a rightward shift in the market supply curve, resulting in a lower market equilibrium price, labeled P_2, and a greater market equilibrium quantity, labeled Q_2. **1 point**



(ii) On the firm's graph from part (a), show a lower price, labeled P*, extended from the new market equilibrium price, P_2, and show a lower quantity produced, Q*, at the new intersection point of P*= MR_2 = MC = minimum ATC. **1 point**



Total for part (c) **2 points**

(d)(i) State that the market equilibrium quantity will be less than the allocatively efficient quantity and explain that the positive externality in production causes the marginal social cost to be less than the marginal private cost (MSC < MPC) at the market equilibrium. **1 point**

(ii) State that total economic surplus will increase and explain with **ONE** of the following: **1 point**

- The quantity produced will increase to the allocatively efficient quantity.
- Deadweight loss will decrease to $0.
- The marginal private cost will equal the marginal social cost, causing the externality to be internalized.

Total for part (d) **2 points**

Total for question 1 **10 points**

Question 2: Short — 5 points

(a)	Calculate the marginal revenue product (MRP) of the 2nd worker as \$55 and show your work. $\text{MRP}_{(\text{2nd worker})} = (\text{Marginal Product} \times \text{Marginal Revenue})$ $= (20 - 9) \times \$5 = 11 \times \$5 = \$55$	**1 point**
(b)	State that diminishing marginal returns will begin with the hiring of the 3rd worker.	**1 point**
(c)	State that the profit-maximizing number of workers is 4 and explain that the MRP of the 4th worker (\$25) is greater than the marginal factor cost (MFC) of the 4th worker (wage = \$15), and that the hiring of the 5th worker would decrease profits because the MRP (\$10) is less than the MFC of the 5th worker (\$15).	**1 point**
(d)	Calculate the economic profit as \$60 and show your work. $\text{Economic Profit} = \text{Total Revenue} - \text{Total Cost}$ $\text{Economic Profit} = \text{Total Revenue} - \text{Total Fixed Cost} - \text{Total Variable Cost}$ $\text{Economic Profit} = (\$5 \times 32) - \$40 - (\$15 \times 4)$ $= \$160 - \$40 - \$60 = \$160 - \$100 = \$60$	**1 point**
(e)	State that the number of workers hired will stay the same and explain that the increase in fixed cost does not affect the marginal factor cost of producing rain jackets.	**1 point**
	Total for question 2	**5 points**

Question 3: Short — 5 points

(a)	State yes and explain that this firm is a natural monopoly because it experiences decreasing average total costs over the entire effective demand for its product.	**1 point**
(b)	State the area of deadweight loss is equal to **ONE** of the following areas: • bfg • $\frac{1}{2} \times (P_5 - P_1) \times (Q_4 - Q_2)$	**1 point**
(c)(i)	State the regulated price is P_3 and the regulated quantity is Q_3.	**1 point**
(ii)	State no and explain with **ONE** of the following. • Area cjg is the remaining deadweight loss. • The deadweight loss is reduced by area bfjc but is not eliminated completely. • P_3 is greater than (or not equal to) marginal cost at Q_3. • Q_3 is less than (or not equal to) the socially optimal quantity Q_4.	**1 point**
	Total for part (c)	**2 points**
(d)	State the firm will earn negative economic profit and explain with **ONE** of the following: • At the socially optimal quantity, Q_4, average total cost (P_2) is greater than price (P_1). • At the socially optimal quantity, Q_4, the area of negative economic profit is P_1P_2dg. • At the socially optimal quantity, Q_4, the area of negative economic profit is $(P_2 - P_1) \times Q_4$.	**1 point**
	Total for question 3	**5 points**